# EXPOSURE TO AIR POLLUTION FROM TRAFFIC AND CHILDHOOD ASTHMA IN THE SWEDISH BIRTH COHORT BAMSE

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**Background and Aims:** Epidemiological studies of the association between traffic-related air pollution and long-term effects on the development of childhood airway disease have shown inconsistent results. We aimed to assess the development of allergic and non-allergic asthma in children up to 8 years of age, in relation to exposure to residential outdoor air pollution from traffic during the 1st year of life.
**Methods:** The spatial distribution of nitrogen oxides from traffic (traffic-$NO_x$) and inhalable particulate matter from traffic (traffic-$PM_{10}$) in the study area was assessed using emission inventories and dispersion models. Estimated levels were used to assign first-year exposure levels for children in prospective birth cohort BAMSE (n=4089), by linking to geocoded home addresses. Children were followed with questionnaires at 0, 1, 2, 4 and 8 years, and blood samples were taken at 4 and 8 years. Asthma was defined as ≥4 episodes of wheeze in the last 12 months or 1 episode in combination with inhaled corticosteroids. *Asthma* at 4 and 8 years was subdivided in *allergic* or *non-allergic* according to presence of sensitization to inhalant allergens. The association between air pollution and asthma was analyzed using multiple logistic regression.
**Results:** Air pollution exposure during the first year of life was associated with non-allergic asthma (OR for 47 μg/m³ traffic-$NO_x$ corresponding to the $5^{th}$–$95^{th}$ percentile difference in the cohort =2.4; 95% CI=1.0 – 5.6 at 4 years, and 2.6; 0.9 – 8.1 at 8 years). No association with allergic asthma was found (OR = 1.5; 95% CI=0.4 – 5.1 at 4 years and 0.8; 0.2 – 2.4 at 8 years). Results were similar using traffic-$PM_{10}$, which was highly correlated to traffic-$NO_x$ (r=0.95).
**Conclusions:** Exposure to moderate levels of locally emitted air pollution from traffic during infancy appears to increase the risk of non-allergic asthma in children up to 8 years of age.